

Jedidiah R. McClurg

Contact Information	Jedidiah R. McClurg Dept. of Computer Science http://www.jrmcclurg.com/ Room ECEE 1B61A Univ. of Colorado Boulder jrmcclurg@gmail.com Engineering Center Boulder, CO, 80309 (USA) skype:jedmcclurg
Interests	Programming Languages, Verification, Synthesis, Software-Defined Networking (SDN)
Education	University of Colorado Boulder , Boulder, Colorado, USA <ul style="list-style-type: none">• Ph.D., Computer Science, Aug 2013 - May 2018 (expected)<ul style="list-style-type: none">– Research Group: CUPLV (Programming Languages and Verification)– Topic: Program Synthesis for Software-Defined Networking– Adviser: Prof. Pavol Cerny– Overall GPA: 4.0 / 4.0 Northwestern University , Evanston, Illinois, USA <ul style="list-style-type: none">• M.S., Computer Science, Sep 2011 - Aug 2013<ul style="list-style-type: none">– Topic: Trigger Compilation for Energy-Efficient Reactive WSN Behavior University of Iowa , Iowa City, Iowa, USA <ul style="list-style-type: none">• B.S.E., Electrical and Computer Engineering, Aug 2004 - May 2009<ul style="list-style-type: none">– Mathematics minor
Awards and Honors	Outstanding TA Award, University of Colorado Boulder, \$500 (Apr 2014) Research Community Development (RCD) Award, CU Boulder, \$1850 (Oct 2013) Dean's Fellowship, University of Colorado Boulder, \$5000 (Aug 2013 - Jul 2014) University Fellowship, University of Colorado Boulder, \$1000 (Aug 2013 - Jul 2014) Walter P. Murphy Fellowship, Northwestern U., \$16K + tuition (Sep 2011 - Aug 2012) Innovation Disclosure, Rockwell Collins Advanced Technology Center, \$600 (May 2011) Presidential Scholarship, University of Iowa, \$28K + tuition (Aug 2004 - May 2008) National Merit Scholarship, University of Iowa, \$9500 (Aug 2004 - May 2008) National Merit Scholarship, Rockwell Collins, \$2500 (Aug 2004) University of Iowa Engineering Excellence Scholarship, \$1000 (Aug 2004)
Travel Grants	Travel Grant, SIGPLAN, PLDI Conference, \$510 (May 2016) CS/Dean's Travel Grant, University of Colorado Boulder, \$1300 (Feb 2016) Travel Grant, NSF, PLDI/FCRC Conference, \$1028 (Apr 2015) CS Travel Grant, University of Colorado Boulder, \$1000 (Feb 2015) TGS Travel Grant, Northwestern University, \$500 (Sep 2012) EECS Travel Grant, Northwestern University, \$300 (Sep 2012) Travel Grant, NSF, Summer School on Formal Techniques at SRI, \$500 (May 2011)
Academic Experience	University of Colorado Boulder , Boulder, Colorado, USA <i>Graduate Research Assistant</i> , January 2014 - present Working on research related to program synthesis for SDN. <i>Graduate Teaching Assistant</i> , August 2013 - December 2013 Assisted with CSCI 3155 Principles of Programming Languages.

Northwestern University, Evanston, Illinois, USA

Graduate Research Assistant, September 2011 - June 2013

Worked on research related to PL for wireless Sensor Networks (WSN).

Graduate Teaching Assistant, September 2012 - March 2013

Assisted with EECS 317 Data Management and Information Processing, and EECS 211 Fundamentals of Computer Programming II.

University of Iowa, Iowa City, Iowa, USA

Graduate Research Assistant, January 2010 - December 2010

Added wireless functionality to an embedded glucose sensor device (ECE Dept.). Wrote proof checker generator software, and a Lustre code translator (CS Dept.).

Graduate Teaching Assistant, January 2010 - May 2010

Provided general lab support and assisted the EE Senior Design class instructor with grading.

Undergrad. Teaching Assist., Jan '09 - May '09, Jan '08 - May '08, Aug '07 - Dec '07

Provided instruction and assistance to students in the lab, maintained/updated lab equipment, and graded lab reports and homeworks for the Digital Design (introduction to digital logic) class.

Undergrad. Research Assist., Jan '07 - May '07, Aug '06 - Dec '06, Jan '06 - May '06

Worked in the Dept. of Mathematics, designing and developing an interactive web-based Calculus learning tool for beginning undergraduates.

Undergraduate Teaching Assistant, January 2007 - May 2007

Hosted weekly tutorial/discussion sessions with students, graded homeworks, wrote exam questions, and presented exam review sessions for the Engineering Problem Solving II (introduction to C programming) class.

**Current
Research
Projects**

Program Synthesis for SDN (with Prof. Pavol Cerny and Prof. Nate Foster)

Developing approaches for formally specifying customizable correctness properties in the context of SDN, and techniques for efficiently synthesizing suitable network updates and event-driven programs with respect to these.

Publications

Conference Papers In Submission

- [11] Jedidiah McClurg, Hossein Hojjat, Nate Foster, and Pavol Cerny. Synthesizing Event-Driven Network Programs from Traces. 2016.

Peer-reviewed Conference Papers

- [10] Hossein Hojjat, Philipp Ruemmer, Jedidiah McClurg, Pavol Cerny, and Nate Foster. Optimizing Horn Solvers for Network Repair. In *the 16th Intl. Conf. on Formal Methods in Computer-Aided Design*. **FMCAD 2016**.
- [9] Pavol Cerny, Nate Foster, Nilesh Jagnik, and Jedidiah McClurg. Optimal Consistent Network Updates in Polynomial Time. In *the 30th Intl. Symposium on Distributed Computing*. (32 / 132 = 24%), **DISC 2016**.
- [8] Jedidiah McClurg, Hossein Hojjat, Nate Foster, and Pavol Cerny. Event-Driven Network Programming. In *the 37th ACM SIGPLAN Conference on Programming Language Design and Implementation*. (49 / 304 = 16%), **PLDI 2016**.
- [7] Vaibhav Rastogi, Zhengyang Qu, Jedidiah McClurg, Yinzhi Cao, and Yan Chen. Uranine: Real-time Privacy Leakage Monitoring without System Modification for Android. In *the 11th EAI International Conference on Security and Privacy in Communication Networks*. (30 / 108 = 28%), **SecureComm 2015**.

- [6] Jedidiah McClurg, Hossein Hojjat, Pavol Cerny, and Nate Foster. Efficient Synthesis of Network Updates. In *the 36th ACM SIGPLAN Conf. on Programming Language Design and Implementation*. (58 / 303 = 19%), **PLDI 2015**.

Peer-reviewed Workshop/Demo Papers

- [5] J. Protzenko, S. Burckhardt, M. Moskal, and Jedidiah McClurg. Implementing Real-time Collaboration in TouchDevelop using AST Merges. In *the 3rd Intl. Workshop on Mobile Dev. Lifecycle*. **MobileDeLi 2015**.
- [4] Hossein Hojjat, Jedidiah McClurg, Pavol Cerny, and Nate Foster. Network Updates for the Impatient: Eliminating Unnecessary Waits. In *the 1st Workshop on PL and Verification Technology for Networking*. **PLVNET 2015**.
- [3] David S Hardin, Jennifer A Davis, David A Greve, and Jedidiah R McClurg. Development of a Translator from LLVM to ACL2. In *the 12th International Workshop on the ACL2 Theorem Prover*. **ACL2 2014**.
- [2] Jennifer Davis, David Hardin, and Jedidiah McClurg. Creating Formally Verified Components for Layered Assurance with an LLVM-to-ACL2 Translator. In *the 7th Layered Assurance Workshop*. **LAW 2013**.
- [1] Jedidiah McClurg, Goce Trajcevski, and Jesse Yanutola. Demo Abstract: Collaborative Reactive Behavior in Heterogeneous Wireless Sensor Networks. In *the 10th ACM Conference on Embedded Networked Sensor Systems*. **SenSys 2012**.

Talks

- Event-Driven Network Programming
 - PLDI 2016, Portland, OR, USA, June 16, 2016
 - CU Boulder, CUPLV Group, Boulder, CO, USA, May 27, 2016
- Efficient Synthesis of Network Updates
 - PLDI 2015, Portland, OR, USA, June 16, 2015
 - CU Boulder, CUPLV Group, Boulder, CO, USA, June 5, 2015
 - (with Pavol Cerny) CU Boulder, NGN Group, March 6, 2015
- AST-based Collaborative Editing
 Microsoft Research, RiSE Group, Redmond, WA, USA, June 25, 2014
- Virtual Machine Support for Parallel Language Runtimes
 Northwestern EECS 441 Class Final Presentation, Evanston, IL, USA, May 30, 2012
- Detecting Android Privacy Leaks via Dynamic Taint Analysis
 (with Jonathan Friedman and William Ng) Northwestern EECS 450 Class Final Presentation, Evanston, IL, USA, May 30, 2012
- Industrial Verification Using the KIND Model Checker
 (with Lucas Wagner) Air Force Research Labs (AFRL) Safe and Secure Systems and Software Symposium (S5), Dayton, OH, USA, Jun 14, 2011

Academic Service

- Artifact Evaluation Committee (AEC) Member: POPL 2016
 Reviewer: TACAS 2016, CAV 2014, ASE 2014

Completed Projects

- Dynamic Analysis for Dalvik Bytecode*, March 2012 - June 2012
 Internet Security class project which enabled basic instrumentation for Android applications at the bytecode level. This project was continued as the *Uranine* system [7].
- Virtual Machine Support for Parallel Language Runtimes*, March 2012 - June 2012

Project in Resource Virtualization course which enabled the Racket language to run on a small OS. My additions to the Kitten OS were adopted by the OS designers at Sandia National Labs.

L5 Compiler, March 2012 - June 2012

Compiler Construction class project involving the design of a compiler for a Scheme-like higher-order functional language. I also worked with the course instructor to design a copying garbage collector now used in the course.

Low Power Data Logger, August 2007 - May 2008

Senior Design class project involving design, construction, and testing of a microcontroller-based data logger with removable memory card support.

Modem Emulator, August 2007 - December 2007

Principles of EE Design class project involving design, construction, and testing of a microcontroller-based Bell 202 modem receiver.

Skills

Desktop environments: Ubuntu (Linux), Solaris, Windows, Cygwin

Embedded platforms: Android, SunSPOT, TelosB, Microchip, Freescale

Programming languages: OCaml, Scala, Java, C, C++, Perl, Python, SML, Racket

Formal verification: ACL2, HOL, Lustre, Yices, SPIN, NuSMV, MiniSat, Alloy

Compiler construction: Xtext, OCamlLex, OCamlYacc, LLVM, X86

Hardware design: VHDL, Verilog, Xilinx, PSpice, I²C, SPI, SD/MMC, USB

Networking: nesC, TinyOS, Sockets, TCP/IP, ZigBee (802.15)

Web development: PHP, MySQL, HTML, CSS, JavaScript, Apache, JSP, Tomcat

Web frameworks and content-management systems (CMS): WordPress, Django

Mathematical software: Mathematica, MATLAB, L^AT_EX

Other tools: Git, Subversion, Eclipse, VirtualBox

Professional Experience

Microsoft Research, Redmond, Washington, USA

Research Intern, March 2014 - June 2014

Worked in the RiSE group, building support for realtime collaborative code-editing into the TouchDevelop project.

Rockwell Collins, Inc., Cedar Rapids, Iowa, USA

Graduate Intern, June 2013 - August 2013

Worked in the Advanced Technology Center building a translator from LLVM assembly code into ACL2 to facilitate reasoning about binaries.

Graduate Intern, January 2011 - August 2011

Worked in the Advanced Technology Center developing and using verification tools in an avionics context.

Graduate Co-op, November 2009 - June 2010

Worked in the SATCOM department developing test software for a military satellite terminal waveform and writing various scripts and documentation.

Engineering Co-op, September 2008 - December 2008

Worked in the Panels department designing hardware/software for commercial airliner cockpit panels and designing/configuring panel test equipment.

Technical Intern, June 2004 - August 2004

Worked in the Advanced Technology Center developing GUI frontends related to testing and benchmarking of a software-defined radio.

aJile Systems, Inc., Cedar Rapids, Iowa, USA

Technical Intern, June 2002 - August 2002

Developed benchmark applications for a JAVA bytecode processor.

Memberships	Association for Computing Machinery (ACM)
Citizenship	United States
Miscellaneous	Erdős number ≤ 4 Typing speed: 80 wpm <i>StackOverflow</i> participation: 2500+ reputation, 17 badges (member since Aug 2012) <i>AskUbuntu</i> participation: 400+ reputation, 7 badges (member since Aug 2012)
Websites	StackOverflow: http://www.stackoverflow.com/users/1613162/808sound/ AskUbuntu: http://www.askubuntu.com/users/83597/808sound/ GitHub: http://www.github.com/jrmcclurg/ LinkedIn: http://www.linkedin.com/in/jrmcclurg/